# Position Details

## CSIRO Early Research Career (CERC) Postdoctoral Fellowship– CSOF4

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| The following information is for applicants |
| Advertised Job Title | CSIRO Postdoctoral Fellowship: Computational Geneticist in Plant Breeding |
| Job Reference | 97412 |
| Tenure | Specified Term of 3 years Full-time  |
| Salary Range | AU$96,329 to AU$105,517 pa plus up to 15.4% superannuation |
| Location(s) | Canberra, ACT |
| Relocation Assistance | Will be provided to the successful candidate if applicable |
| Applications are open to | All Candidates |
| Position reports to the | Team Leader, Alexandre Boyer |
| Client Focus – Internal | 80% |
| Client Focus – External | 20% |
| Number of Direct Reports | 0 |
| Enquire about this job | Contact Warren Conaty via email at Warren.Conaty@csiro.au or phone +61 2 6799 1515 |
| How to apply | Apply online at <https://jobs.csiro.au/> Internal applicants please apply via **Jobs Central**If you experience difficulties when applying, please email careers.online@csiro.au or call 1300 984 220. |

 **Acknowledgement of Country**

CSIRO acknowledges the Traditional Owners of the land, sea and waters, of the area that we live and work on across Australia. We acknowledge their continuing connection to their culture and pay our respects to their Elders past and present. View our [vision towards reconciliation](https://www.csiro.au/en/about/Indigenous-engagement/Reconciliation-Action-Plan)

 **Child Safety**

CSIRO is committed to the safety and wellbeing of all children and young people involved in our activities and programs. View our [Child Safe Policy](https://www.csiro.au/en/about/policies/child-safe-policy).

### Role Overview



CSIRO Agriculture & Food's Cotton Biotechnology Group requires an innovative and forward-thinking computational geneticist/genomics breeder to join the CSIRO Cotton Breeding Program. This CERC Fellow will develop and validate statistical approaches for predicting field performance of cotton plants and breeding lines under rainfed (dryland) production systems using genomic data, as well as assessing the value of incorporating environment, ancestry, and other omic data streams into a genomic selection model. The CERC Fellow will expand upon the conventional phenotype-based breeding approaches currently used by our breeding team to deliver successful cotton cutivars.

### Duties and Key Result Areas:

Under the direction of the senior research scientists, the CERC Postdoctoral Fellow will:

* Carry out innovative, impactful research of strategic importance to CSIRO that will, where possible, lead to novel and important scientific outcomes including designing and implementing robust statistical approaches and computational pipelines to model the relationships between cotton genotypes and their field-based phenotypes (yield and fibre quality) from rainfed production systems across various growing seasons and environments.
* Recognise and exploit opportunities for innovation and the generation of new theoretical perspectives, and progress opportunities for the further development or creation of new lines of research. This will include the analysis of prediction accuracies of genomic selection models for different rainfed cotton agronomic traits and the refinement of the models or approaches to incorporate environment, pedigree, phenomics and additional -omic data.
* Record, manage, and analyse data using relevant data science techniques. Data streams will include cotton genotype and phenotype data as well as pedigree, environmental, additional phenomic and other omic data sets. This will require close collaboration with the teams generating the data to ensure that it remains relevant for both conventional and advanced genetic approaches to cotton improvement.
* Maintain an in-depth familiarity with recent advances in quantitative genetics and applications of Genomic Selection in different crops and animals that may also be applicable to cotton.
* Communicate complex research findings to the CSIRO cotton breeders and industry partners in an understandable manner to assist them in developing new breeding strategies and decision-making tools to enhance the rate of genetic gain in cotton and increase the profitability and sustainability of Australian cotton production.
* Publish research findings through Annual Reports, new research funding proposals and peer-reviewed scientific papers, helping to ensure the high standards of research outputs from the team and improved cotton breeding processes.
* Communicate effectively and respectfully in the interests of good business practice, collaboration and enhancement of CSIRO’s reputation.
* Produce high quality scientific papers suitable for publication in quality journals and for presentation at national and international conferences.
	+ Proactively undertake development to grow effective researcher capabilities to support career goals.
	+ Adhere to the spirit and practice of CSIRO’s Code of Conduct, Health, Safety and Environment procedures and policy, Diversity initiatives and Making Safety Personal goals.
	+ Other duties as directed.

The CERC Fellow learning, development and training programis developed between the CERC Fellow and their CSIRO supervisor. The program will focus on enhancing the Fellow’s capabilities to the level expected of an independent researcher and will include on-the-job and course-based development encompassing:

* discipline-specific techniques and protocols,
* professional growth,
* project management,
* communication and influencing skills, and
* working and collaborating with others.

## **Selection Criteria**

#### Essential

*Under CSIRO policy only those who meet all essential criteria can be appointed.*

1. A doctorate (or will shortly satisfy the requirements of a PhD) in a relevant discipline area, such as quantitative or statistical genetics, biostatistics, computational biology, genomics or plant breeding.

Please note: To be eligible for this role you must have **no more than 3 years** (full-time equivalent) of relevant research experience.

1. Demonstrated expertise in developing and applying a wide range of analyses for genetic parameter estimation, GWAS, and Genomic Selection, preferably in crop species.
2. Demonstrated skills in the handling and analysis of large genotype and phenotype datasets, including the generation of genomic relationship matrices, generation of genomic breeding values using high-dimensional statistical predictive models, and genotype imputation pipelines.
3. An understanding of and experience with statistical and machine learning methods to predict quantitative or qualitative traits based on high dimensional genomic data, such as best linear unbiased prediction, penalized regression, Bayesian regression, random forest, support vector machine, neural network and deep learning.
4. Evidence of advanced programming skills in languages and statistical software packages relevant to biostatistics and bioinformatics (e.g. R, Python, SAS or equivalent).
5. High level written and oral communication skills with the ability to represent the research team effectively internally and externally, including the presentation of research outcomes at national and international conferences.
6. A sound history of publication in peer reviewed journals and/or authorship of scientific papers, reports, grant applications or patents.
7. A record of science innovation and creativity, including the ability & willingness to incorporate novel ideas and approaches into scientific investigations.

## **Desirable:**

1. Knowledge of current and emerging breeding and genetics practices in crop improvement.
2. Experience with high-performance computer environments.
3. Experience in plant breeding or in collaborating with commercial breeding programs.
4. Remain productive, positive and resilient in complex, ambiguous and/or uncertain environments.
5. The ability to work effectively as part of a multi-disciplinary, potentially regionally dispersed research team, plus the motivation and discipline to carry out autonomous research.
6. Knowledge of mathematical modelling of climate data.

## **Required Competencies:**

* **Teamwork and Collaboration:** Cooperates with others to achieve organisational objectives and may share team resources in order to do this. Collaborates with other teams as well as industry colleagues.
* **Influence and Communication:** Uses knowledge of other party's priorities and adapts presentations or discussions to appeal to the interests and level of the audience. Anticipates and prepares for others reactions.
* **Resource Management/Leadership:** Allocates activities, directs tasks and manages resources to meet objectives. Provides coaching and on the job training, recognises and supports staff achievements and fosters open communication in the team.
* **Judgement and Problem Solving:** Investigates underlying issues of complex and ill-defined problems and develops appropriate response by adapting/creating and testing alternative solutions.
* **Independence:** Recognise and makes immediate changes to improve performance (faster, better, lower cost, more efficiently, better quality, improved client satisfaction).
* **Adaptability:**Copes with ambiguity or situations that lack clarity. Adapts readily to changing circumstances and new responsibilities (which may include activities outside own preferences) in the interests of achieving team objectives. Recognises the need for and undertakes personal development as a result of changes.

To be appointed as a Postdoctoral Fellow within CSIRO, the successful candidate will be expected to have **submitted** their PhD at the time of commencement, as a minimum requirement, if PhD conferment has not been obtained. If a candidate has submitted, but their PhD has not yet been formally attained, the starting salary will be CSOF4-1 (AU$93,267). Upon CSIRO receiving written confirmation that the PhD has been awarded (within a six-month period from commencement date), the salary will be increased to the negotiated level and the difference will be back-paid to the Officer’s start date.

Special Requirements

Appointment to this role may be subject to conditions including provision of a national police check as well as other security/medical/character clearance requirements.

* The successful candidate will be asked to obtain and provide evidence of a National Police Check or equivalent. Please note that people with criminal records are not automatically deemed ineligible. Each application will be considered on its merits.
* If the successful candidate is not an Australian Citizen or Permanent Resident, they may be required to undergo additional security clearances, which may include medical examinations and an international standardised test of English language proficiency (i.e. IELTS test).- https://ielts.com.au/

**Our value proposition**

We want CERC Fellows to join our world class science, engineering and digital teams to solve big, complex problems that make a real difference to the future of Australia and the world.

You'll get to work with some of the most talented minds in their fields, not just in Australia, but in the world. At CSIRO, we spark off each other, learn from each other, trust each other and collaborate closely to achieve more than we could individually.

Find out more about our CSIRO Early Research Career (CERC) Fellow Experience Employee Value Proposition (EVP) [here](https://www.csiro.au/en/careers/postdoctoral-fellowships).

**About CSIRO:**

We solve the greatest challenges through innovative science and technology. To find out more visit us [online](http://www.csiro.au/)!

CSIRO is a values-based organisation.  In your application and at interview you will need to demonstrate behaviours aligned to our values of:

* 1. People First
	2. Further Together
	3. Making it Real
	4. Trusted

Find out more about CSIRO [Agriculture and Food](https://www.csiro.au/en/Research/AF)